

Hunter MO\*, Pinto AS, dos Santos CO, dos Santos MP, de Macedo IN, de Lima GSA, Neto MBR, Vieira DLM, Ferreira Jr LG (2026)

**Zero-Deforestation Land Use Scenarios in the Brazilian Cerrado: Pasture Intensification for Agriculture, Livestock and Regeneration.**

*Regional Environmental Change* \*[maria.hunter@ufg.br](mailto:maria.hunter@ufg.br) Remote Sensing and GIS Lab (LAPIG), Federal University of Goiás (UFG),

Goiânia-GO, 74001-970, Brazil

**ESM 4** Mean and standard deviation of aboveground (AGC), belowground (BGC) and soil carbon stocks ( $\text{Mg ha}^{-1}$ ) in future land use scenarios for 2025, 2030 and 2050 by land cover, as estimated using the Century 4.5 model simulating land cover change in 2025. Low and medium vigor pastures are specific to the Targeted Regeneration (TR) Scenario. High vigor pastures (old and new), and soy cover the same areas in both the Full Regeneration (FR) and TR Scenarios. Regeneration of native vegetation in the TR Scenario covers a subset of areas included in the FR Scenario.

| Year     | Compartment | Pasture<br>Old High Vigor |         | Pasture<br>New High Vigor |         | Soy       |         | Regeneration |         | Regeneration |         | Pasture<br>Low Vigor |         | Pasture<br>Medium Vigor |         |
|----------|-------------|---------------------------|---------|---------------------------|---------|-----------|---------|--------------|---------|--------------|---------|----------------------|---------|-------------------------|---------|
| Scenario |             | FR and TR                 |         | FR and TR                 |         | FR and TR |         | FR           |         | TR           |         | TR                   |         | TR                      |         |
|          |             | Mean                      | Std Dev | Mean                      | Std Dev | Mean      | Std Dev | Mean         | Std Dev | Mean         | Std Dev | Mean                 | Std Dev | Mean                    | Std Dev |
| 2025     | ABC         | 5.56                      | (0.51)  | 4.47                      | (0.36)  | 3.86      | (0.69)  | 2.95         | (0.88)  | 2.98         | (0.31)  | 2.68                 | (0.27)  | 3.37                    | (0.25)  |
|          | BGC         | 2.54                      | (0.33)  | 1.69                      | (0.14)  | 1.78      | (0.26)  | 7.75         | (1.45)  | 7.89         | (1.48)  | 1.26                 | (0.17)  | 1.61                    | (0.16)  |
|          | Soil*       | 36.82                     | (6.16)  | 29.28                     | (4.50)  | 30.78     | (4.79)  | 31.97        | (5.73)  | 31.94        | (5.78)  | 30.81                | (5.90)  | 31.86                   | (5.47)  |
| 2030     | ABC         | 5.51                      | (0.31)  | 5.53                      | (0.20)  | 4.04      | (0.60)  | 3.69         | (0.39)  | 3.72         | (0.37)  | 2.67                 | (0.22)  | 3.35                    | (0.20)  |
|          | BGC         | 2.61                      | (0.31)  | 2.43                      | (0.21)  | 1.46      | (0.21)  | 8,11         | (1.22)  | 8.21         | (1.25)  | 1.31                 | (0.17)  | 1.68                    | (0.16)  |
|          | Soil*       | 36.41                     | (6.08)  | 30.66                     | (4.31)  | 30.58     | (4.76)  | 31,31        | (5.43)  | 31.30        | (5.49)  | 30.02                | (5.53)  | 31.13                   | (5.20)  |
| 2050     | ABC         | 5.49                      | (0.43)  | 4.94                      | (0.27)  | 3.90      | (0.68)  | 8,34         | (1.83)  | 8.45         | (1.79)  | 2.56                 | (0.26)  | 3.23                    | (0.24)  |
|          | BGC         | 2.44                      | (0.30)  | 2.07                      | (0.18)  | 1.37      | (0.23)  | 14,33        | (3.48)  | 14.54        | (3.44)  | 1.21                 | (0.18)  | 1.56                    | (0.18)  |
|          | Soil*       | 35.29                     | (5.88)  | 32.41                     | (4.46)  | 28.51     | (4.45)  | 30,49        | (5.31)  | 30.51        | (5.38)  | 28.29                | (4.96)  | 29.59                   | (4.72)  |

\*Carbon stocks in soil organic material (0 – 20 cm)